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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---------------------------------------------------------------------------------------------------|-------------|----------------------|---------------------|------------------|
| 10/518,592 | 12/21/2004 | Jorn Tidow | 3165-112 | 2831 |
| 6449 | 7590 | 01/13/2006 | EXAMINER | |
| ROTHWELL, FIGG, ERNST & MANBECK, P.C. 1425 K STREET, N.W. SUITE 800 WASHINGTON, DC 20005 | | | LEE, RIP A | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 1713 | |

DATE MAILED: 01/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|--------------------------------------|-------------------------------------|--|
| Office Action Summary | Application No. 10/518,592 | Applicant(s) TIDOW ET AL. | |
| | Examiner Rip A. Lee | Art Unit 1713 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 11-20 is/are pending in the application.
4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 11-14 and 16-20 is/are rejected.
- 7) ☒ Claim(s) 15 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>12-21-2004</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 18-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Schroeder *et al.* (WO 99/04634; equivalent document U.S. 6,410,042).

Schroeder *et al.* discloses a mixture comprising 80 wt % of sulfur and 19 wt % of sodium ligninsulfonate having a particle distribution of 40 % of less than 2 μm (example 2).

3. Claims 18-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Weiss *et al.* (U.S. 5,496,789).

Weiss *et al.* discloses a suspension of 150 mg of finely divided sulfur (distribution: 20 % < 1 μ , 50 % < 5 μ , 90 % < 10 μ) and 20 mg (11 wt %) of sodium lignin sulfonate (col. 6, lines 4-8).

4. Claims 18-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Lambert (FR 2,374,852).

The example in Lambert discloses particulate sulfur coated with about 20 wt % of lignin sulfonate (page 4, line 10 and 11) in which the majority of particles (80 %) have a particle size of 2-7 μm (page 4, line 15).

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5. Claims 11-14 and 16-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Ryan (U.S. 2,195,827).

Ryan discloses a material comprising 420 pw of resin, 60 pw of sulfur and 3 pw of the the condensation product of naphthalene sulfonic acid and formaldehyde, and 70 pw of a caseinate solution. The dispersed product is then ground in a ball mill until the particle size was less than 30 μm (col. 2, lines 30-45 and table). The product is used for vulcanization of rubber.

Allowable Subject Matter

6. Claim 15 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Applicants invention relates to a process in which a mixture comprising a component of 20-96 wt % of sulfur and 4-80 wt % of a complexer and having an average particle size of 0.05-20 μm is added to a rubber/latex in order to vulcanize the rubber/latex wherein the mixture itself is free flowing and has a particle size of 50 μm to 4 mm.

The subject matter of claim 15 is not taught or fairly suggested in the prior art.

Relevant prior art not relied upon but pertinent to Applicant's disclosure is cited below.

Yoshida (JP 62-052108) discloses treatment of granular sulfur with 0.1-50 wt % of ethylene glycol, diethylene glycol, or triethylene glycol. In the working example, sulfur having an average particle size of 50 μ to 1 mm is treated with 16 wt % of ethylene glycol.

Tantillo *et al.* (DE 26 04 695) teaches a sulfur paste for use as pesticide comprising 50 pw of sulfur and 3 pw of calcium ligninsulfonate. The particle size is on order of 400 mesh.

Schwarzbach (U.S. 5,308,500) teaches a wettable sulfur composition comprising 80 wt % of sulfur and 20 wt % of ligninsulfonate. No particle size is indicated.

Tucker (U.S. 2,028,482) teaches treatment of flowers of sulfur (particulate sulfur) with a dispersing agent derived from the condensation of naphthalenesulfonic acid and formaldehyde. No particle size information is indicated.

Zanuccoli (U.S. 5,599,373) teaches a sulfur-based agricultural soil corrective made from pellets comprising 93 wt % of sulfur, 5 wt % of clay, and 2 wt % of lignin sulfonate. The pellet has a particle size of 325 mesh (45 μm).

Stastny *et al.* (U.S. 3,755,518), Mayer-Mader *et al.* (U.S. 3,704,283), and Hornig *et al.* (U.S. 3,506,605) teach a vulcanizate comprising diene-based elastomer, sulfur and the condensation product of β -naphthalenesulfonic acid and formaldehyde. Here, all components are compounded together using standard mixing processes. The patents do not teach a particulate sulfur component having a particle size of 0.05-20 μm .

Bögemann *et al.* (U.S. 1,783,216) discloses vulcanization of diene-based elastomer in the presence of sulfur and complexing agents such as ethylenediamine, diethylenetriamine, and triethylene tetramine. Components are compounded together using standard mixing processes. The patent does not teach a particulate sulfur component having a particle size of 0.05-20 μm .

Ehman *et al.* (U.S. 2,201,124) teaches preparation of amicronic sulfur particles by treatment with complexing agents such as triethylene glycol, diethylene glycol, and propylene glycol. The reference does not teach a particulate sulfur component having a particle size of 0.05-20 μm .

References, GB 826,161 and GB 1,396,757 were cited as "X" references in a corresponding international search report. Amended claims recite a component having an average particle size of 0.05-20 μm . The patents teach compounding of ingredients with diene-based elastomer, but they do not teach the component of the instant claims having the designated particle size. Thus, these references no longer apply to the amended claims in the U.S. application.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rip A. Lee whose telephone number is (571)272-1104. The examiner can be reached on Monday through Friday from 9:00 AM - 5:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached at (571)272-1114. The fax phone number for the organization where this application or proceeding is assigned is (571)273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <<http://pair-direct.uspto.gov>>. Should you have questions on the access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll free).

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January 10, 2006



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